

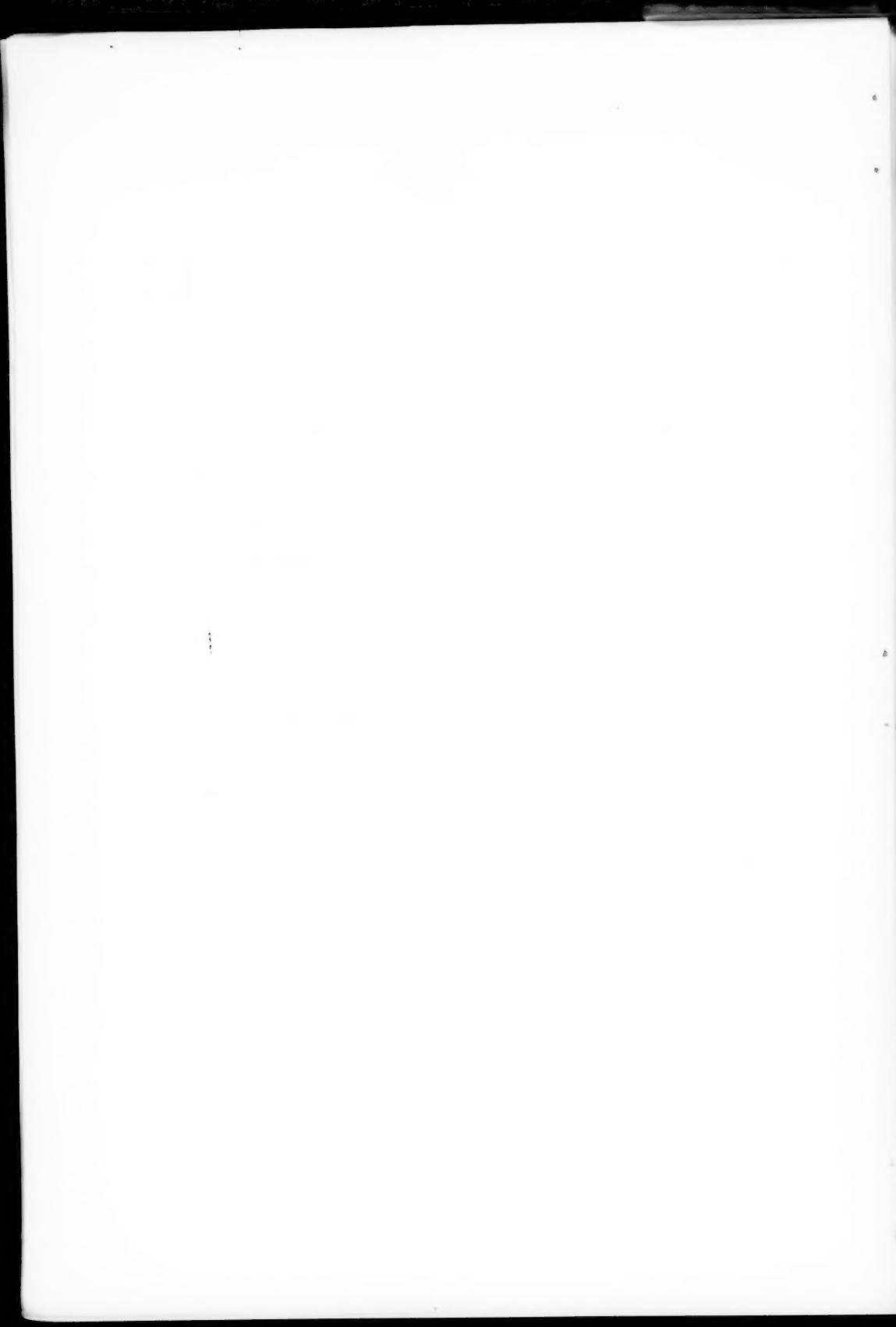
No. 410
1956

Vol. 70
No. 3

**A Study of Adoptive Children:
III. Relationships Between Some Aspects of
Development and Some Aspects of
Environment for Adoptive Children**

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Psychological Monographs: General and Applied

A Study of Adoptive Children: III. Relationships Between Some Aspects of Development and Some Aspects of Environment for Adoptive Children¹

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INTRODUCTION

THE FOLLOWING pages present the third phase of a rather lengthy investigation of adoptive children. The first phase, "Interviews as a source of scores for children and their homes" (17),² described our efforts to provide

some measuring devices which were appropriate to our interests and in keeping with limitations imposed by the nature of our total investigation. The second phase, "The predictive validity of the Yale Developmental Examination of Infant Behavior" (18) has been described in terms of our efforts to find a useful degree of predictive significance for the infant examination; our efforts in this direction were unsuccessful.

The present phase suggests respects in which characteristics of children's environment may be correlated with characteristics of their development. Specifically, the present report is concerned with a general question which was phrased in the following manner at the time our study was planned and support was sought from the Russell Sage Foundation:

"What characteristics of adoptive homes (placements) may be shown to be

II. The predictive validity of the Yale Developmental Examination of Infant Behavior" (*Psychol. Monogr.*, 1956, Vol 70, No. 1 [Whole No. 409]).

¹ The staff of the project wishes to express its appreciation to Dr. Donald Young, Director of the Russell Sage Foundation, and to Dr. Carl Hovland and Dr. Milton Senn of Yale University. The nature and the quality of this effort have been greatly influenced by such friends and advisers as Dr. Joseph Baldwin, Dr. Nancy Bayley, Dr. Harold Jones, Dr. Neal Miller, Dr. Robert Sears, and Dr. Helen Thompson. We are indebted also to Dr. Leonard Cottrell, Dr. Liselotte Fischer, Dr. Else Frenkel-Brunswik, Dr. Marjorie Honzik, Dr. Mary Cover Jones, Dr. Frederick Mosteller, and Dr. A. J. J. Van Woerkom. We are particularly grateful to the adoptive families who participated in this investigation, the child placement agencies who cooperated with us and guided our efforts, and to Adelaide Piscitelli, David Macklin, David Jenkins, and Peter Field who helped in the analysis of the data and the preparation of the manuscript.

² References for the present report are listed on page 231. The pagination of the present report is continuous with the second report of this series, entitled "A study of adoptive children:

correlated with characteristics of adoptive children?"

It should be noted that this question requires that we consider a wide range of measures of the child's development and of the child's environment. We obviously are not committed to an "explanation" of any relationships that we find nor are we committed to a precise determination of the ultimate magnitude or degree of any of the relationships suggested by our data.

Despite the exploratory nature of our investigation, its results have implications for three related topics of current interest: the placement practices of child welfare agencies, the child-training practices of parents, and theories and beliefs concerning the development of the personality. Because of the implications of the study, we sought to conduct our central analyses with respect to two samples. One sample comprised 114 adoptive children who were in their fifth or sixth year of life but who were not yet involved in the work of the first grade. Our second sample comprised 81 adoptive children who were past the work of the first grade but were not yet preadolescent in their development; seventy per cent of these children were in their eighth or ninth year of life. It was hoped that these two samples would provide mutual confirmation for some of the readily confirmable trends and suggest qualifications for trends that most require qualification. We have been greatly concerned with the manner in which observed trends or relationships may be interpreted. Since our analyses describe relationships between fairly definable characteristics of the child's environment and fairly definable facets of his development, there is danger that one may overgeneralize and prematurely or incorrectly ascribe a literal, causal significance to

our specific environmental variables.

Although the relationships to which we draw the reader's attention meet conventional criteria for statistical significance, we do not know how much practical significance to ascribe to them. Almost without exception they are plausible and consistent with possible implications of current theories of personality development. Nevertheless, the relatively crude, untried nature of some of our variables, particularly our measures for the environment, does not permit us to make confident statements concerning the degree or the importance of the relationships suggested by our data. Before we can be confident of the practical importance of these relationships, confirmatory studies should be undertaken. Such studies should draw upon samples which differ in certain respects from ours and should make use of hoped-for refinements in our measuring devices.

The purpose of our investigation requires that we examine the relationships between numerous aspects of the child's development and numerous aspects of his environment. The breadth of our interest in these two classes of variables is indicated in our descriptions of the first and second phases of our total investigation, "*Interviews as a source of scores for children and their homes*" and "*The predictive validity of the Yale developmental examination of infant behavior*." For the purposes of the present report we are interested in describing relationships for the variables which are most important and have the greatest general interest. We have considered as unimportant those variables which have fewer statistically significant relationships than could be expected on the basis of chance alone and those whose evidence of relationship is with respect to other variables of obscure or restricted importance. Variables

that are uniquely relevant to the adoptive situation and may have little general interest are also eliminated from the present report.

THE DATA

Let us first review the measures for the environment which are employed in the present report. One important aspect of the child's environment concerns the child-rearing practices of the home. As described in our report, "*Interviews as a source of scores for children and their homes*," we conducted lengthy semi-structured interviews with the children's mothers, and during the course of these interviews gathered a standard body of specific information concerning child-rearing practices. Specific questions, however, were avoided. On the basis of both statistical and psychological criteria, the various bits of information were organized into clusters which enabled us to score the interview material with respect to such phases or qualities in child rearing as eagerness on the part of the mother, general lack of sympathy toward the child, severity of toilet training, and others included in the outline (Table 1) provided below.

In addition, the interview with the mother was extended to include the values, the organization, and the general atmosphere of the home. Information relevant to these aspects of the home was gathered by our social worker also, who visited the homes as our first direct contact with the adoptive parents. This information was organized into clusters and provided the basis for cluster scores descriptive of the home per se; we refer to these cluster scores as *Conditions of Child Rearing*. They are included in our outline (Table 1) below.

In addition, we were able to employ measures based on simple factual infor-

mation. One of these, the *Educational-Occupational Composite Score*, is defined as follows: If the adoptive father's occupation was business or professional or in the white-collar group, a weight of plus one was arbitrarily assigned. If, however, his occupation was unskilled, semiskilled, or skilled, the weight was minus one. A weight of zero was assigned in all situations where we did not know the adoptive father's occupation. The father's education was combined by allowing plus one if he had attended college, minus one if he had not attended college, and zero when we did not know what his educational background was. The mother's education was weighted in a similar manner. These three sets of weights were combined algebraically to form a general composite score representing the educational-occupational status of the home. Another score, which we consider to be an indication of the strength and stability of the home, is called the *Age-Duration of Marriage Composite Score* and is defined in the following manner: If the adoptive father was in his thirties, a weight of plus one was arbitrarily given; if he was under thirty or forty or over (5), a weight of minus one was given; if his age was unknown, a weight of zero was given. The same weighting system was used for the age of the adoptive mother. In addition, if the couple had been married seven or more years, a weight of plus one was given; if they had been married less than seven years, a weight of minus one was given; and if the duration of their marriage was unknown to us, a weight of zero was given. These three weights were combined algebraically to give us a composite measure of the age of parents and duration of their marriage.

Because of its general interest and apparent importance, we have included the

TABLE I
A SUMMARY OF ENVIRONMENTAL VARIABLES

	Younger Sample	Older Sample
Child-Rearing Practices Clusters (based on interview with the mother)	Eagerness .57* Unsympathetic .44 Severe Toilet Training .44 Punishment for Aggression .78	Overcontrolling .32* Unsympathetic .33 Severe Toilet Training .45 Punishment for Aggression .82
Conditions of Child-Rearing Clusters (based on interview with the mother and on social worker's visit to the Home)	Ambition .78 Harmonious Family Relationships .58 No Ambition .72 Rejection of Child .76 Parental Incompatibility .73 Overprotectiveness .77	Ambition .77 Harmonious Family Relationships .60 No Ambition .74 Rejection of Child .68 Parental Incompatibility .52
Composite Scores (based on data descriptive of adoptive parents)	Educational-Occupational Composite Age-Duration of Marriage Composite	Educational-Occupational Composite Age-Duration of Marriage Composite
Adoptive Placement	Age at adoptive placement	Age at adoptive placement

* Split-half reliabilities for cluster scores; Spearman-Brown formula.

age of adoptive placement of the child as one of the environmental variables. These variables are all summarized in the outline in Table 1, and split-half reliabilities are provided for the cluster scores. It is suggested that the reader refer to our report, "Interviews as a source of scores for children and their homes" (17), which provides a detailed description of our procedure for building cluster scores.

Our efforts to secure appropriate measures for the children's development are described in detail in our preceding reports (17, 18). We employed the conventional tests for mental, scholastic, and physical development. In addition, we made numerous behavior ratings and also constructed numerous cluster scores which, it was hoped, would give us some standard estimates of personal and social aspects of the children's development. One set of cluster scores was based on an interview with the children. This interview (the Social Reaction Interview) was of a simple question-and-answer type and concerned the children's evaluation of

their own behavior. Another set of cluster scores was based on the mother's description of the child and emerged from the Child-Rearing Practices interview.

The most important and the most interesting of our measures of the children's development are summarized in the outline in Table 2. Some of these, such as the intelligence tests and the scholastic achievement tests, are tried and true and known to be both reliable and valid. Many of the aspects of the child's physical development secured as a part of a pediatric-neurological examination may also be claimed to be reliable and valid, but they offered so few evidences of relationship with our environmental variables that (with the exception of one variable, a Weight Quotient found by dividing a child's weight by his age) they are excluded from our summary. Our various measures for the children's personal-social development are new and are less reliable than the tests of intelligence. Nevertheless, they have sufficient reliability to indicate the presence of relation-

TABLE 2
A SUMMARY OF THE DEVELOPMENTAL VARIABLES

Criterion	Younger Sample	Older Sample		
I. Intellectual development	Stanford-Binet IQ Arthur IQ	Stanford-Binet IQ Arthur IQ		
II. Scholastic achievement	(none relevant)	Reading Spelling Arithmetic		
III. Motor development	(no promising relationships)	(no promising relationships)		
IV. General physical development (based on neurological-pediatric examination)	Weight quotient	(no examination given)		
V. Personal-social development				
A. Child's reaction to himself—the Social Reaction Interview	Dependence on adults Socialized compliance Takes adult role Weakness-avoidance	.88* .70 .69 .57	Cooperation with authority .41*	
B. Mother's reaction to the child—Child-Rearing Practices Interview	Compulsive Aggressive Phobic Dependent	.52 .70 .57 .71	Aggressive Anxious Dependent Anxious-aggressive Spoiled child Controlled	.64 .56 .60 .80 .78 .78
C. Ratings made by examiners	Sensitivity to failure	Sensitivity to failure		

* Split-half reliabilities for cluster scores; Spearman-Brown formula.

ships, where definite relationships exist. Although the measures of personal-social development have the obvious handicap of uncertain reliability and of newness, they are possibly as desirable as any other currently available measures; rating procedures for relevant phases of the child's development have been provided by Baldwin (2), but his procedures were infeasible in our study of adoptive families.

Particular consideration should be given to the adoptive status of our children and their families. This circumstance has certain advantages. It makes our results directly relevant to certain child-placement practices and of immediate interest to child-placement workers. It also suggests that some of our relationships between aspects of the child's development and aspects of his environment may be independent of heredity as a confounding third variable. Our data may, therefore, add convincingly to the considerable body of evidence relevant to the importance of environmental factors in the child's development, particularly those aspects of

development which are often called personal and social.

Readers will seek practical interpretations for our results. Accordingly, we must explicitly indicate certain possible sources of confounding which could lead to alternative interpretations. We have considered three major sources of possible confounding in the relationships between characteristics of the child's environment and characteristics of his development.

1. Our subjects were adoptive children living in adoptive homes. It is possible that knowledge of the true parents was a factor in the selective placement of the adoptive children; we have evidence which favors this possibility. If this knowledge of the true parents has an hereditary significance, one would expect respective hereditary attributes of the children to be correlated with any characteristics of the adoptive homes which were selected on the basis of knowledge of hereditary attributes of the true parents. For some of our trends relating characteristics of the child with character-

istics of his environment, this alternative explanation is plausible and an hereditary hypothesis is a reasonable alternative to an environmental hypothesis.³ Other relationships involve characteristics of the environment and characteristics of the child for which no hereditary hypothesis is generally recognized; for these relations an *ad hoc* hereditary hypothesis would be particularly implausible because those who mediated the adoptions could not have had the relevant information concerning either the true parents or the subsequent practices of the adoptive parents.

2. Despite our failure to find evidence for the predictive validity of the infant examination (18), it is possible that some readers believe that the infant examination had for our criteria a predictive validity which we failed to discover. Since the infants were placed selectively as a result of the infant examination, some of the correlations between aspects of the adoptive home and aspects of the child's development could emerge as a result of the fact that both the environment (as a result of selective placement) and criteria of development (as a result of putative validity of the baby test) are correlated with the infant examination. We have conducted analyses which are relevant to this possible source of confounding. Specifically, the relationships between aspects of the environment and aspects of development which are revealed in our total group were studied in a subgroup where the infants were placed adoptively *before* the infant examination. In this subgroup, where no selective placement could have resulted from the infant examination, we still find the general pattern of relationships between as-

pects of the child's environment and aspects of his development.

3. As a third source of confounding, one might wonder whether some of the relationships between descriptions of the child and descriptions of the home provided by our interviews are not correlated because of their common source, either because of bias on the part of the mother or because of bias on the part of the interviewer. We have three reasons for doubting that this is an important source of confounding:

- (a) Neither the mother nor the interviewer knew how the various bits of information were to be combined to form cluster scores and we greatly doubt if any *a priori* considerations would have been sufficient to yield the particular pattern of results we have.
- (b) We find that when the descriptions of the child emerging from the psychologist's interview with the mother are correlated with the same kind of environmental information from two *different* sources, viz., the social worker's visit to the home and the psychologist's interview with the mother, the pattern of relationship is uniform and essentially unchanged. (Obviously a relationship between the child and the home is not dependent upon a common source of information.)
- (c) The general sense of the relationships between characteristics of the home as they are known through the interview with the mother and characteristics of the child as they are known from the interview with the mother is not challenged wherever other sources of relevant information concerning the child and major objective facts concerning the home are available.

³ A sample of adoptive children placed at random in adoptive homes could provide a basis for a conclusive test for this hypothesis.

THE CORRELATIONS

Table 3 provides a summary of the correlations between the most promising criteria of the child's development and the most interesting measures of the child's environment; these data are for the younger sample. The results for the older sample are presented in Table 4. Scrutiny of these two tables reveals many similarities between them with respect to their over-all implications and provides some assurance that the trends indicated are not peculiar to one sample alone, and are not the capricious result of sampling fluctuations. As we shall note in our subsequent discussions, the implications of some of these correlations are in good agreement with the implications of relationships described by other investigators.

The absolute magnitudes of the relationships indicated by our data are relatively small. This, however, may be in part an expression of the crude nature of the variables which we were obliged to use in our exploration. The hypothesis that the intrinsic relationships suggested by our data may in truth be strong is worthy of the most serious consideration and should be explored by means of refinements in the devices we have used.

As already indicated, the reader may be concerned with the possibility of certain sources of confounding. Therefore we must point out the situations where we consider a possibility of confounding to exist and, wherever possible, we must eliminate confounding as an alternative explanation for the trends we describe.

Let us consider first those relationships where a confounding with heredity may be suspected. Heredity may be suspected as a common third variable in our relationships between criteria of development and measures of the environment

when the aspect of a child's development is commonly suspected to be an hereditary expression of a comparable attribute in the parent. This is particularly important when both the environmental facets (which we have found to be correlated with this putative hereditary aspect of development) and the putative hereditary attribute of the parent could have been known by those who were involved in the adoptive placement of the infant; stated somewhat differently, an hereditary explanation for our trends may be considered in those cases where an attribute of the true parent is known by those responsible for the child's placement and where the relevant features of the adoptive family could have been known so that selective placement based on knowledge of the true parents could have occurred.

Among our measurements of development those aspects which possibly are most commonly considered to have an hereditary basis could be the Binet IQ, the Arthur IQ, and the Weight Quotient. The correlated aspects of the child's environment which might have been known by the placement workers (or could have in some way been factors in selective placement in a manner relevant to the brightness or the size of the true parents) could be expressed by the cluster scores Ambition and No Ambition and the composite scores Educational-Occupational Status and possibly Age-Duration of Marriage. The ambiguous status and the uncertain meaning of the relationships between the mental aspects of the child's development and such features of his environment are a familiar problem to psychologists. The correlations obviously describe relationships between the environment and the child's development and one may hypothesize that the relationship is an expression of

TABLE 3
A SUMMARY OF THE RELIABLE RELATIONSHIPS BETWEEN CRITERIA* FOR THE CHILD'S DEVELOPMENT AND SOME MEASURES OF HIS ENVIRONMENT
(Younger sample, N = 114**)

Criteria of Child's Development	Child-Rearing Practices Clusters				Conditions of Child-Rearing Clusters				Composite Scores			
	Eager-ness	Unsym- pathetic	Severe Punish- ment Toilet Training	Ambition for Aggres- sion	Harmo- nious Family Relation- ships	No Rejection of Ambition Child	Parental Overpro- tection Incom- patibility	Age at Marriage	Education- Occupation Composite	Adop- tive Placement		
I. Intellectual development												
A. Stanford-Binet IQ	.20	—	—	—	.37	—	—					
B. Arthur IQ	—	-.32	—	—	—	—	—					
II. Scholastic achievement (older sample only)												
III. Motor development (no promising relationships)												
IV. General physical development Weight Quotient (no other promising relationships)												
V. Personal-social development												
A. Child's reaction to himself (So- cial Reaction Interview with the child)												
Dependence on adults	—	—	—	—	—	—	—					
Socialized compliance	—	—	—	—	—	—	—					
Takes adult role	—	—	—	—	—	—	—					
Weakness-avoidance	—	—	—	—	—	—	—					
B. Mother's reaction to the child (Child-Rearing Practices In- terview with the mother)												
Compulsive	—	—	—	—	—	—	—					
Aggressive	—	—	—	—	—	—	—					
Phobic	—	—	—	—	—	—	—					
Dependent	—	—	—	—	—	—	—					
C. Ratings made by examiners (Test Reaction Scale filled in by psychologist)												
Sensitivity to Failure (no other promising relation- ships)	—	—	—	—	—	—	—					

* Criteria which showed no more evidence of relationships than could be ascribed to chance were eliminated from consideration.

** r significant at the .05 level $\geq .19$; r significant at the .01 level $\geq .25$.

TABLE 4
A SUMMARY OF THE RELIABLE RELATIONSHIPS BETWEEN CRITERIA* FOR THE CHILD'S DEVELOPMENT AND SOME MEASURES OF HIS ENVIRONMENT
(Older sample; $N = 81^{**}$)

Criteria of Child's Development	Child-Rearing Practices Clusters				Conditions of Child-Rearing Clusters				Composite Scores			
	Over-Controlling	Unsympathetic Training	Punishment for Aggression	Ambition	Harmo-nious Family Relationships		No Rejection Parental Ambition		Age-Du-composite	Education Occupation Composite	Age at Adoptive Placement	
					Child	Parent	Child	Parent				
I. Intellectual development												
A. Stanford-Binet IQ	—	—	.29	.26	-.25	—	—	—	-.30	—	-.26	
B. Arthur IQ	.39	—	.29	—	—	—	—	—	.39	—	-.37	
II. Scholastic achievement												
Reading	—	.22	—	—	—	—	—	—	—	—	—	
Spelling	—	—	.22	—	—	—	—	—	—	—	—	
Arithmetic	—	—	.22	—	—	—	—	—	—	—	—	
III. Motor development (no promising relationships)												
IV. General physical development (younger sample only)												
V. Personal-social development												
A. Child's reaction to himself (Social Reaction Interview with the child)	—	—	—	-.27	—	—	—	—	—	—	—	
Cooperation with Authority (no other promising relationships)												
B. Mother's reaction to the child (Child-Rearing Practices Interview with the mother)												
Aggressive	—	.25	.30	.26	—	—	-.28	.31	—	—	—	
Anxious	—	.35	.42	.35	—	—	—	.41	—	—	—	
Dependent		—	—	—	—	—	—	—	—	—	—	
Anxious-aggressive		.24	—	—	—	—	—	-.34	—	—	—	
Spoiled child		.27	.36	.33	—	—	—	.36	—	—	—	
Controlled		—	—	.42	—	—	—	.36	—	—	—	
Controlled by examiner (Test Reaction Scales filled in by psychologist)				-.31	—	—	—	-.29	—	—	—	
C. Reaction to Father (no other promising relationships)	—	—	—	—	—	—	-.24	—	—	—	—	

* Criteria which showed no more evidence of relationships than could be ascribed to chance were eliminated from consideration.

** r significant at the .05 level $\geq .22$; r significant at the .01 level $\geq .29$.

differences in environment per se. One may also hypothesize that the relationships are an expression of the fact that the differences in the environment are organized, i.e., selected on the basis of differences in the true parents, and that the relationship between the environment and aspects of development is but an indirect expression of an intrinsic relationship of an hereditary nature between the true parents and the adoptive children. In keeping with this hypothesis, we have found significant relationships between the educational-occupational composite score for the true parents and the educational-occupational score for the adoptive parents (it would appear that some selective placement based on knowledge of the true parents had occurred). In addition, we have found significant relationships between the educational-occupational scores of the true parents and the Binet IQ's of the children.

This pattern of relationships is equally consistent with either an environmental hypothesis or an hereditary hypothesis. Does the correlation between the true parents' educational-occupational status and the child's Binet IQ occur merely as an incident to the fact that knowledge of the true parents had something to do with the adoptive placement (i.e., an environmental pattern which may have influenced Binet IQ) of the children? Does the correlation between the environmental factors and the Binet IQ of the children occur merely as an accident of the fact that selective adoptive placement was based in part on such knowledge of the true parents as their educational-occupational status (which in the opinion of some readers may express the kind of hereditary difference which may also find expression in Binet IQ)?

Wherever obvious possible sources of

confounding may be discarded, the relationships are much more provocative both from the practical and from the theoretical point of view than where the possibility of confounding is obvious but not subject to evaluation. It will be noted in Tables 3 and 4 that we have employed our *total* younger sample and our *total* older sample in showing the relationships between the most promising criteria of development and the most promising measures for the environment. The reader may recall from our study of the validity of the infant examination (18) that in one of the subgroups of children, where the infant examination seemed to be most satisfactory to the examiner, there was indication that the infants were placed in their adoptive homes selectively so that correlations between the infant examination and certain aspects of the adoptive homes emerged. The aspects of the adoptive homes which seemed to have been selected partly on the basis of the infant examination included the Ambition cluster score, the No Ambition cluster score, the Educational-Occupational composite score for the adoptive parents, and the Age-Duration of Marriage composite score for the adoptive parents. In Tables 3 and 4 it may be noted that those aspects of the environment are correlated with the Binet IQ and that the two composite scores also show some relationship with the Arthur IQ. If (despite our failure to find any indication that the infant examination is predictive of either the Binet or the Arthur) the reader continues to believe that some important relationship nevertheless exists, he might suspect that the relationships between the Binet and those aspects of the environment are but artifacts. Specifically, he might suspect that the relationship between the Binet and these as-

TABLE 5

CORRELATIONS BETWEEN MENTAL ABILITY AND CERTAIN ASPECTS OF THE ENVIRONMENT WHICH
WERE SELECTED ON THE BASIS OF THE INFANT EXAMINATION; A COMPARISON BETWEEN
THE TOTAL YOUNGER GROUP OF 114 AND A SUBGROUP OF 32 PLACED
ADOPTIVELY BEFORE THE INFANT EXAMINATION

Test	Group	Cluster Scores		Composite Scores	
		Ambition	No Ambition	Education-Occupation	Age-Duration of Marriage
Binet IQ	Total younger group	.27	-.26	.31	.39
	Selected-before subgroup	.36	-.36	.28	.28
Arthur IQ	Total younger group	—	—	.19	.27
	Selected-before subgroup	—	—	.25	.12

pects of the environment emerge from the fact that both the Binet and the environmental variables are correlated with the infant examination. Although we consider this possibility to be extraordinarily unlikely, readers of this persuasion will be interested in the correlations for a sample of children who were placed in their adoptive homes *before* they received an infant examination and for whom there could be no possible confounding between the infant examination and the environment of the adoptive homes. We refer to this special group where no selective placement based on the infant examination could occur as the "selected-before group." In Table 5 comparisons are provided between the correlations for this selected *before* group and the *total* group. This comparison is conducted for the younger sample only, because the "selected-before group" for the older sample was quite small. It will be seen that the correlations between the aspects of the environment and the IQ's are essentially the same for the selected-before group as they are for the total group. It is obvious that such correlations between aspects of the child's development and aspects of his environment are not dependent upon confounding with the infant examination.

It is of incidental interest that such comparisons were made for all of the correlations between aspects of environment and the various criteria of development, and the essential similarity of relationships was observed.

Since the families in which the adoption was mediated by the agencies were reached by us through the agencies, one might suspect that this possible selective influence in our follow-up could have influenced the relationships revealed by our data; i.e., one might suspect that the agencies would be more successful in helping us reach those homes where there was a "correspondence" between the home and the child than where there was not. Since our children who were placed adoptively before an infant examination were almost entirely independent placements, the data for this group provide an incidental control (see Table 5). The relationships between the environmental aspects and the developmental aspects are essentially the same for the group placed before the infant examination as they are for the total group. Other specific analyses between groups placed independently and groups placed by agencies show that in *both* groups relationships between aspects of the environment and aspects of development emerge. Although the agencies may

have some selective influence in our follow-up (see the description of our sample in the preceding monograph [18]), this influence is not necessary for the trends and relationships we describe.

In the preceding section we also recognized the possibility that some of the relationships between characteristics of the child based on the mother's description and characteristics of the home conceivably could be confounded either because the mother was a common source for much of these data or because the data emerged from a given interview and could have been biased by the interviewer. Since neither the mother nor the interviewer knew how the various bits of data were to be combined in order to form cluster scores, it seems improbable that our relationships are the result of bias. Fortunately, it is possible for us to show that some of the relationships between aspects of the environment and aspects of the child's personal-social development are not necessarily dependent upon bias. For example, some of the items of the Rejective cluster score were gathered by the social worker at the time of her visit to the home and the same items were gathered also by the psychologist at the time of her interview with the mother. Despite the fact that these bits of information were gathered by different people at different times and in different contexts, the limited Rejective cluster scores from these two sources are correlated to the order of .60; both the limited Rejective cluster score based on the psychologist's data alone and the identical limited Rejective cluster score based on the social worker's data alone show the same pattern of relationships with the Compulsive, Aggressive, and Phobic cluster scores for the child. (The general sense of these correlations is indicated in Tables 3 and 4.) These partic-

ular correlations at least are not dependent upon bias or confounding at the source of the data.

The over-all pattern of the relationships which are described in Tables 3, 4, and 5 does not require us to conclude that any of the obvious sources of confounding are necessary for our relationships. We are therefore inclined to consider most seriously the possibility that these correlations indicate that the environment may play some kind of facilitating or delimiting role in the aspects of child development which we have studied. Certainly our data are in no sense a proof of this environmental hypothesis, but in view of its great practical implications for parents, child-placement workers, and others interested in the development of children, it is a hypothesis which should be most seriously considered by the skeptical and should provide some encouragement to those who employ environmental considerations when explaining, anticipating, or planning for the development of children. Nevertheless, it would be premature to reject alternative hypotheses for the observed relationships, and at least for some of our relationships alternative hypotheses are clearly possible. For example, the relationships between the measures of mental ability and our measures of the home which are indicative of socioeconomic status could very well express a confounding with hereditary influences resulting from selective placement of the infant based on knowledge of the true parents. In addition, it is possible that some confounding of the bias of the mothers or the bias of the interviewer is involved in the relationships between child-rearing practices of the home as described by the mother and the characteristics of the child as described by the mother. It should be obvious to the

reader, however, that the possibility of confounding in these relationships is not clear *evidence* for confounding, and should not deter us from a serious consideration of the possible practical implications of these relationships.

It is of interest to note that there are several relationships described in Tables 3 and 4 which appear to be independent of any plausible confounding of sources of data. For example, we have no reason for considering the confounding of source of data hypothesis as an explanation for the correlations between the cluster scores based on the child's Social Reaction Interview and any of our measures for the environment. Moreover, we do not have any confounding hypothesis for the relationship between Sensitivity to Failure on the part of the child and Ambition on the part of the adoptive parent. We believe that our analyses eliminate any obvious confounding hypothesis for the relationships between the Rejective cluster score and the various aspects of the child's development. We have no confounding explanation for the suggestion that rejective, unsympathetic, and punishing influences may detract from Arthur IQ in our younger sample. With respect to the age-of-adoptive-placement variable, we see no reason for using a confounding hypothesis for the various relationships involved in aspects of the child's development. It should be unnecessary to add, however, that age of adoptive placement *per se* is not a very obvious explanatory concept; nevertheless it seems quite possible that environmental differences associated with age of adoptive placement may very well have the importance implied by the correlations offered in Tables 3 and 4.

The reader may be concerned with the fact that although the correlations for the younger and the older samples in

general may be seen as mutually confirmatory, there are some relationships which are not confirmed. We believe that the discrepancies between the results for the two samples may be explained in terms of the differences in age of the two samples and the difference in the circumstances which accompany differences in age. There were also some slight changes in the placement practices of agencies which could contribute to differences in the two age groups.

DISCUSSION

The correlations that have been described require further discussion. As we shall see, such a discussion is most fruitful when it is based on a brief survey of the relevant data provided by the psychological literature. In the following paragraphs we shall present a terse description of studies which are most conspicuous from the standpoint of rigor and sample size. This survey is not intended to be exhaustive, but it should serve both to confirm our empirical findings and to help us interpret them. The studies presented first have to do with mental ability, and it will be seen that the investigators, like us, are involved with the possibility that the relationship between measures of mental ability and aspects of the environment are in some manner confounded with heredity.

In the published studies describing the relationship between aspects of the child's personal-social development and aspects of his environment, the children are all living with their true parents and the question of whether or not the relationships are confounded with common heredity need not be raised because this possibility of confounding is so conspicuous.

Since it seems to us particularly improbable that heredity could be a hidden

third variable to account for the relationships we have observed between various aspects of the child's environment and various aspects of his personal-social development, we are greatly interested in the possibility that the reports of others, where this confounding could have occurred, are in general confirmed by our data. If our data, where hereditary confounding seems particularly improbable, confirms the implications of these other studies, we may be increasingly confident that the environmental implications of the studies of others concerning the child's personal-social development are not necessarily an indirect expression of hereditary influences.

Any congruence between the implications of our investigation and of the investigations of others with respect to the personal-social development of children has an additional significance for our investigation. In some parts of our investigation, we may suspect that bias of the mother may have produced part of the correlation between the child-rearing practices of the mother and her description of the child. If the implications of our data are consistent with the implications of the data provided by other investigators where this particular source of confounding is improbable, we may place added confidence in that portion of our results where we might fear that the mother's bias is a possible source of our relationships.

Let us proceed with our review. In 1928 Barbara Burks published a report that revealed relationship between the intelligence of foster children and the cultural index of the foster home (6). Her study showed evidence of relationship between the child's IQ and each of the following: family income, home ownership, number of books in child's library, and the amount of home instruction given the child. Although the correlation coefficients are not sufficiently high to provide a useful basis for prediction, they are sufficient to suggest strongly that the opportunities and the stimulations provided by

a child's environment may have a role in his mental development.

In 1935 Alice Leahy published a report which was similar to Burks' with respect to design, purpose, and implications (10). It should be pointed out that in both these studies there is indication that the mental ability and intellectual and other attainments of the foster parents bear a relationship with the mental ability of the foster child. It must be considered, of course, that the children may have been placed selectively in the foster homes. As a matter of fact, this is probable because, in general, persons responsible for adoptive placement attempt to match the expectations of the adoptive families with the developmental promise of the adoptive child.

The probability of such relationships as these being solely due to selective placement is reduced by several analyses described by Freeman in 1928 (7). He showed that adoptive siblings who had been reared apart were correlated in intelligence to the order of .25, whereas other investigators have found that the intelligence of siblings living together is about .50. This reduction in sibling resemblance could be taken as indication that an important part of the similarity between siblings is due to a similarity in their environments. In addition, Freeman also reports that where there are relatively great differences in the cultural rating for the foster home, the correlation between pairs of separated siblings with respect to intelligence is only .19, whereas if pairs of separated siblings went into foster homes which were similar to each other with respect to cultural rating, the correlation between such pairs of siblings was .50. The disparity in intelligence that differences in environment may produce (i.e., environmental differences as introduced in Freeman's groups of siblings placed in separate foster homes) is particularly impressive evidence for the importance of environment in the development of mental ability. This appears especially probable when it is noted that for the most part Freeman's children spent several early years living together in their original home. As a complement for this analysis, Freeman also examined the correlation between the intelligence test scores for 72 pairs of unrelated foster children who were living in the same foster home. The correlation for these unrelated foster siblings who had a common home environment was .37.

In 1931 Sims (15) reported a study which has implications very similar to those provided by Freeman's analyses. He formed 203 pairs of children who were unrelated but who were living in homes matched with respect to socioeconomic status as measured by the Sims Score Card (and matched with respect to certain other factors not directly relevant to our present interests).

The correlation between IQ's for these 203 pairs of unrelated children was .35, i.e., unrelated children who have similar homes tend to have similar IQ's.

In both Freeman's and Sims' studies it is possible that the children in the same homes were selected in some manner so that their "heredity" was similar, and that Freeman's correlation of .37 and Sims' correlation of .35 should be ascribed to similar environment plus similar heredity. From the practical standpoint, however, we do not know that the heredity was similar. Nevertheless, we do know of some similarity in the environments.

Thus we see that, at least with respect to measured mental ability, environment appears to be an important correlate (the actual determiner is unknown). As may be inferred from the preceding paragraphs, it has not been difficult for investigators to show evidence of relationship between mental ability and facets of the socioeconomic and educational attainments of the child's home. The possibility of showing such relationships is obviously greatly favored by the availability of reliable measures of the mental ability of children. Similarly, some of the aspects of homes where primarily mental attainments are emphasized may be specified rather objectively. In addition, relatively satisfactory measures of the socioeconomic status of homes have been available for a number of different kinds of investigations. Accordingly, it is not surprising that a reliable relationship between the mental ability of the child and some characteristics of the home could be revealed.

With respect to the features of the child's behavior which are often described under the general heading of character, temperament, personality, or adjustment, the research reports often leave much to be desired. Nevertheless, there is a large literature which offers consistent support for a general hypothesis that there are important relationships between a child's personality and his en-

vironment (particularly the environment which comprises the reaction of his parents toward him). Although the published reports corroborate this principle, their content is diversified and as a consequence there are not many which are mutually corroborative in specific respects. This is almost a necessary consequence of the fact that innumerable facets of a child's personality may be of interest to investigators and almost countless aspects of the child's environment may also be the subject of investigators' interests. For this reason the probability of studies overlapping greatly is not large and consequently the possibility of independent corroborative studies is small. Since neither the most relevant aspects of the child's personality nor the most relevant aspects of a child's environment is a matter of general agreement, devices for measurement which are well developed and generally understood have not yet emerged in this area of inquiry. As a matter of fact suitable indices of a child's personality or of his interpersonal environment are relatively rare. Many of the devices that have been employed are of uncertain reliability, have a meaning which is unique to some special application, or appear to be so heterogeneous in content as to have no specifiable implications. Despite the handicap of great diversity of interest among investigators and of our general impoverishment from the standpoint of measuring devices, studies have emerged which as a group have strongly compelling implications for the importance of the environment as a possible factor in the adjustment of the child.

Only a small and relatively new literature for this field has the merit of usefully large samples, specifiable procedures, and suitable consideration for control. Fortunately, however, the small

scientific and directly relevant literature exists in the context of a huge clinical, anecdotal-speculative, or analogical-experimental literature which in its implication is in general agreement with the more scientific applicable literature. In the following paragraphs a few of the more systematic studies will be mentioned briefly. Perhaps it will be of some interest to the reader if we present the selected studies in the order of their publication.

One of the earliest studies to attract our interest serves as a transition from our foregoing emphasis on intellectual factors to an emphasis on the relationship between interpersonal aspects of a child's environment and the child's personal development. In 1933 David Levy described an investigation wherein eight conspicuously overprotected children were compared with other children on the basis of scholastic achievement (12). In brief he found that the overprotected children were up to standard or possibly accelerated with respect to reading, but were substantially retarded in arithmetic. This difference is simply and plausibly explained in terms of features of the home environment of the overprotected children.

In some cases, data which have been secured in a remote context provide analyses which are of direct interest to our problem. For example, in 1934 Goodwin Watson described an analysis of the responses of graduate students to a questionnaire that had to do with the strictness of the student's home training and with some of the student's personal characteristics (16). It was revealed that students who described strict practices by their parents also reported numerous characteristic tendencies for themselves. Among these were tendencies to be ashamed of their parents, to hold grudges, and to feel that people had been unfair to them. They described in themselves a tendency to be bashful, picky about food, and curious about sexual matters. They also tended to worry. The foregoing tendencies were less characteristic of the graduate students whose responses indicated that the home training was lax. In general this report suggests that strict home training may be associated with the development of aggressive reactions and attitudes, by the development of anxiety characteristics, and by compulsive and dependent manifestations.

In 1936 Newell examined the record of 75 clinic cases of maternal rejection and compared these cases with 82 nonclinic cases (13). Although

his methods of description are more verbal than quantitative, he concludes that if parental rejection is expressed by hostile handling of children, the children tend to be aggressive; expression of parental rejection by consistently protective parental handling was associated with submissive behavior on the part of the children. Newell also points out that the rejective attitudes of the mothers were associated with, and possibly caused by, an unhappy attitude toward marriage.

One of the most extensive studies of relations between the behavior of young children and characteristics of the home was published in 1936 by LaBerta Hattwick (8). Her data for the children's behavior comprised ratings based on several teachers' composite evaluations; ratings on home factors were based on the judgment of one teacher who referred to school conferences with parents and to a home visit. The analysis employed a large number of children drawn from 18 different nursery schools. Tetrachoric correlations were determined between a large number of different types of preschool behavior and 11 different ratings for the home. For the most part the ratings concerning the home were descriptive primarily of parental behavior which would be relevant for the child. The analyses show more promising correlations than could be explained plausibly on the basis of chance, and the behavior patterns implied by the major correlations are for the most part quite plausible. From numerous specific relationships she concludes that overattentive homes tend to produce children who display infantile and withdrawing reactions, and she shows that there is some tendency for neglectful homes to have children who are aggressive. In addition, there is indication that calm, happy homes produce children who are cooperative, and that impatient quarrelsome homes tend to be characterized by children who show uncooperative behavior.

Dorothy Baruch and J. Annie Wilcox describe an analysis of the relationships between ratings of the goodness of a child's adjustment (primarily interpersonal) and kinds of interparent tensions. This was in 1944 (3). The subjects comprised 76 preschool children and their parents. Intellectually the children and the parents were described as a superior group and participation in the study was dependent upon the parent's interest. The data were derived from observations of the child and interviews with the parents. One of the most important factors in the goodness of the children's adjustment was the absence of tension in the parents' sexual behavior; apparently, dissatisfaction concerning the sexual act indirectly contributed to an important degree to unsatisfactory adjustment in children. Lack of consideration of one spouse for another also contributed to unsatisfactory adjustment in

the children, as did unsatisfactory expression of affection between spouses. Thus in general we see that inharmonious or incompatible parents appear to contribute to the adjustment problems of the children.

In 1945 Katherine Read published an account of an analysis which indicated that mothers who expressed approval of liberalism or freedom in the control of children had children whose behavior as measured by the Read-Conrad Inventory was relatively desirable (14). The mothers who approved of strict parental control had children whose behavior was indicated as unfavorable by the Read-Conrad Inventory. The mothers' attitudes were secured by means of a questionnaire whereas the children's behavior was rated by several nursery school teachers.

Although we shall generally avoid an employment of the case history material in our present discussion of the background for our problem, the implications of Watson's and of Read's study provide interesting corroboration in a clinical report of Edith Jackson published in 1947 (9). She describes three cases where strict discipline in early childhood was followed by the development of reactions that could be described as fearful, demanding, and aggressive.

Baldwin, Kallhorn, and Breese, in their 1945 monograph on the patterns of parent behavior (1), present interesting data which is consistent in its implications with trends reported by other investigators. They describe relationships between their parent behavior rating scales (used by social workers in visits to the home) and several characteristics of young school children. Among the numerous findings reported is an interesting relationship between parental rejection and nonconformist attitudes on the part of the children.

It is interesting to note that the tangible reports based upon systematic studies of practical behavior frequently draw the reader's attention to the importance of "democratic" home policies. "Reasonable" control policies appear to be important in assisting the child to become a well-socialized person who can live comfortably with others. Apparently arbitrariness on the part of the parents, or lack of sympathy and understanding, is conducive to the development of negative and destructive reactions on the part of the child.

In 1951 Barbara Bishop described a study

based on 34 mothers and their preschool children (4). This report is based on systematic observations of mother-child interaction. The mothers were described with respect to such categories as lack of contact, directing, criticizing, and noncooperation. The child's behavior was categorized with respect to bid for attention, noncooperation, asking for information, and asking for help. Numerous correlations were reported which were not only statistically significant but which were often in the fifties and the sixties. Although these correlations can scarcely be taken as an evidence that long term patterns of child behavior are associated with important patterns of parental response, this report illustrates nicely that in many given situations an important correspondence exists between the behavior of mothers and the behavior of children.

An unpublished doctoral dissertation by Gerald Lesser describes a well-designed analysis based on (associates' judgment of) the behavior of 44 boys and the child-rearing practices of their mothers (as evaluated by an interview) (11). He reports that rejection by the mother is associated with overt aggression on the part of the child. He also finds that parents who advise aggressive activity have overtly aggressive children and that where aggression is strongly discouraged by the parents overt aggression on the part of the child is reduced.

Although not one of the foregoing references is likely to be regarded as compelling evidence for the importance of the environment in the development of the child's personality, each of them contributes to the plausibility of such a conclusion. For the most part, the samples were small and the measuring devices were not well standardized. In addition, there is little specific replication in content and methodology. Nevertheless, this stream of evidence continuing for the last 20 years has established an important pattern in our beliefs concerning the socialization of the individual. Some of the analyses, like those of Bishop (4), provide us with a kind of "laboratory exhibit" of the interactions which characterize the everyday existence of mother and child. This study obviously cannot be used as an indication of the long-term course of the child's development; it does illustrate however, that there is a systematic action and reaction, and they suggest descriptive components of the circumstances wherein interpersonal habits of the child may be formed in consequence of the pressures and requirements of the mother.

Despite their diversity, the studies of Watson (16), Newell (13), Hattwick (8), Baruch (3), Read (14), and Lesser (11) all suggest strongly that frustration of the child by neglect or harsh treatment evokes in him characteristic destructive responses and fearful attitudes.

Watson's study (16) indicates that strict parents may have more than their share of children whose conspicuous characteristics include aggression and anxiety. If relatively high scores on our Unsympathetic, Severe Toilet Training, and Punishment for Aggression cluster scores are indications of strictness on the part of the parents, it may be seen that the relations shown in Tables 1 and 2 are consistent with this part of Watson's study. Newell's study (13) seems to have similar implications and specifically indicates that hostile rejection on the part of the parents is associated with aggression on the part of the children. We find evidence of this in both our younger and older samples. Newell also points out that the rejective attitude of the mother may be caused by the unhappy attitude toward her marriage. We found (17) that rejective conditions in the home were inversely related with Harmonious Family Relationships and positively related with Parental Incompatibility; this is true for both the younger and the older samples. All of this, incidentally, is in agreement with the implications of the study by Baruch and Wilcox (3). It is of interest to note that Baldwin, Kalhorn, and Breese (2) provide evidence of relationships between parental rejection and nonconformist attitudes on the part of the children. Lesser (11) also indicates that rejective mothers have aggressive children.

Consistencies between our report and other published reports could be shown in numerous detailed respects, but we are most interested in the broad implications of these investigations. In general, they strongly suggest that inharmonious, incompatible homes are likely to be rejective, and that such rejective homes are characterized by children who are fearful and aggressive. We believe that our study

provides an important confirmation of the implications of these published studies. We have shown the pattern of relationships with respect to a wide constellation of variables, and the nature of our sample makes it seem particularly probable that such relationships (between aspects of the home and certain personal-social attributes of the children) as these are not a product of confounding with hereditary (i.e., we have no reason for believing in our sample that the particular relevant knowledge of the true parent and the particular relevant knowledge of the adoptive parent was consistently available to the agencies and systematically employed by them as a basis for selective placement of adoptive infants). It would seem, therefore, that if the agencies wish to reduce the possibility of creating adoptive homes where the child is fearful and aggressive, when they evaluate candidates they should be particularly interested in the harmony of the home, the compatibility of the spouses, and the improbability of the parents being rejective, even in times of disharmony or distress.

SUMMARY

We have explored relationships between various aspects of the children's development and various aspects of their environment for two samples. The younger sample comprised 114 children who were in their fifth or sixth year of life and not yet in the first grade. The older sample of 81 children was past the first grade and not yet pre-adolescent; 70 per cent of these children were in their eighth or ninth year of life. The measures of the children's development which we used included intelligence tests, scholastic achievement tests, measures of growth, and numerous facets of personal-social development. Among these facets of per-

sonal-social development are included the child's statement of his own behavior, the adoptive mother's description of the child's behavior, and examiners' ratings. Some of our measures of the child's development are tried and true; others are novel and untried.

Our measures of the environment were descriptive of the values and status of the adoptive home. Descriptions of the child-rearing practices of the adoptive parents were also available.

The results presented are in many respects similar for both the older and younger samples and lead us to believe that they are not the capricious result of sampling fluctuations.

In presenting the findings we have taken pains to draw the reader's attention to possible sources of confounding. Although the possibility that confounding could exist is no evidence that it did exist, we wish to remind the reader of the possibility, because our results have numerous practical implications and strongly suggest that differences in the environment may find expression in differences in the child's development, and this possibility seems particularly strong for the relationships where we can think of no plausible source of confounding which could detract from the environmental implications of our trends.

The relationships described by this study are not particularly strong and if, as we suspect, many are an expression of the formative role of the environmental differences, we would suggest that they should not be taken as indications of the possible maximal importance of these environmental differences. Because of obvious imperfections in our measures, we believe that the importance of the environment, predictive or causative, may be much greater than indicated by our correlations. For example, the corre-

lation between phobic reactions in the child and unsympathetic child-rearing practices was .33 in our younger sample; neither of these variables is particularly reliable, however, and if such a relationship were examined by the use of reliable measure one might find a practically important relationship (when the well-known correction for attenuation is applied to this correlation of .33, it is raised to .66; when the correlation of .35 between unsympathetic child-rearing practices and anxious reactions in the older children is corrected for attenuation, an estimated correlation of .80 emerges).

Our study was designed as an exploration of possible relationships and was not committed to causal explanation of the relationships. Nevertheless, no plausible alternative explanations (e.g., confounding) are available for many of our relationships, and from these relationships certain important practical implications emerge. One implication is worthy of particular emphasis: inharmonious, incompatible, and rejective adoptive parents may tend to produce children who are aggressive and fearful.

GENERAL SUMMARY

The present report is the third in a series of three monographs: "Interviews as a source of scores for children and their homes" (17), "The predictive validity of the Yale Developmental Examination of Infant Behavior" (18), and "Relationships between some aspects of development and some aspects of environment for adoptive children." These monographs describe three successive phases of a program of research which was designed to provide answers for two questions:

1. How accurately and in what respects can the Yale Developmental Examination of infant behavior be employed to

predict future development for adoptive children?

2. What characteristics of adoptive homes (placements) may be shown to be correlated with characteristics of adoptive children?

Since the subjects for our investigation were adopted children and adoptive parents, certain limitations were imposed upon us. Adoptive families have a special status in our society and an investigation of the children and the child-rearing practices of such families involves special limitations and restrictions; it was necessary for us to plan an investigation which involved a minimum of threat and inconvenience for the cooperating adoptive families. In addition, it was necessary for us to devise procedures for evaluating adoptive children and their homes. However, the desirability of our providing special instruments for evaluation and measurement is not entirely due to the adoptive status of our subjects. There is a conspicuous dearth of practicable, time-tested procedures for evaluating the status of young children and for evaluating the values and the child-rearing practices of the home. Our efforts in this direction are described in the first section of this report.

Since our subjects were voluntary participants and since most of them were recruited with the help of the agencies who mediated the adoptive placements, there were some selective possibilities in our sample which had to be considered. The selective possibility that one might fear most is that the children included in our follow-up study were in some respects different as infants from those whom we were unable to include. Using the various parts of the infant examination as a basis for comparisons, we found no evidence for such a possibility. The indications available to us suggest that

any differences between the families we saw and those we did not see were not due to the child per se but could represent the attitudes of the families toward the Yale Clinic of Child Development or toward the child-placement agencies.

In our exploration of the predictive validity of the infant examination (18), we used many different criteria of the child's development and all different aspects of the infant examination. Nevertheless, we failed to find evidence that the infant examination had a useful predictive validity. It should be emphasized that we examined the predictive validity of all the various facets of the infant examination and that we employed all feasible criteria of development for the adoptive children. Our criteria included the usual measures of mental and scholastic development, the various parts of a standard pediatric-neurological examination, and numerous scores and ratings descriptive of the child's personal and social development. These scores included the child's report on his own behavior, the adoptive mother's description of his behavior, and ratings made by the examiners.

Although we found no evidence for a useful degree of predictive validity and, therefore, cannot refute the hypothesis that the infant examination has no predictive validity, our results should not be taken as positive proof of this hypothesis. It is possible that, had we used some other criteria or had we used an older sample of children, some evidence of predictive validity could have emerged. Nevertheless, we did make a comprehensive effort to find evidence of predictive validity and we failed to find it. Other investigators using measures of mental ability alone have failed similarly to find evidence of predictive validity for infant examinations. It would seem,

therefore, that those who strongly believe that the infant examination has predictive validity should now assume some responsibility for providing systematic data which indicate the nature, if not the degree, of such predictive value.

It should be remembered, however, that we have examined the predictive validity of an *infant* examination. All of the children who were included in our study had received an infant examination before they were 14 months of age. It should also be noted that the children who participated in our study were brought to the Yale Clinic of Child Development for evaluation in connection with their adoption or candidacy for adoption. Children who were grossly ill or obviously handicapped were seen at the Clinic in great numbers, but not as adoptive candidates. We have not sought to evaluate the use of the infant examination as a diagnostic aid for the evaluation of ill or handicapped children; our validating study is not concerned with the general value of the infant examination procedure as a device for evaluating the developmental status of an infant at any one time. We have been concerned with the predictive validity of the infant examination for infants who are possible candidates for adoption, and our results should not be generalized to other problems or situations, particularly of a medical nature, where the current evaluation or diagnosis of an infant is desired.

In this, our third monograph, are described some relationships between various aspects of the child's development and various aspects of his environment. There are descriptions of numerous interesting relationships, but our study, like others, provides no certain causal explanation for them. The analyses strongly suggest, however, that the child's environment may provide opportunities

and limitations which result in differences in a child's development. This is not a novel indication, but our results are novel in that they provide evidence of such relationships in respects which have not heretofore been systematically described, and provide evidence for samples of children who are living in adoptive homes and are not biologically related to their parents. This suggests that some of the relationships between aspects of the child's development and aspects of his environment should be independent of an hereditary explanation, and therefore points definitely toward the importance of environmental differences as a factor in the development of personal-social differences in children.

Here we have considered various sources of confounding which might qualify the value of the environmental hypothesis in describing the relationships. It is acknowledged that some of the relationships could have arisen as a result of confounding with hereditary differences. Specifically, knowledge of some of the attainments of the true parents was available for many of the adoptive infants and we have evidence that this knowledge was used selectively in placing the infants in their adoptive homes. If such knowledge of the true parents as their educational-occupational status expresses hereditary differences, then it is possible that the correlated characteristics of the adoptive parent could show a relationship with aspects of the child's development, such as Binet IQ, as a result of confounding with heredity. We have no means of evaluating such an alternative hypothesis for some of the results. For many of our results, however, the relationship between characteristics of adoptive parents and characteristics of adoptive children could scarcely be described as a confounding with heredity.

In the first place, it is highly improbable that the necessary knowledge of the true parents' characteristics and of the environment to be provided by the adoptive applicants could have been known by the placement workers or could have had a role in the selective placement of the infants. In addition, it is improbable that the selective placement which would be required by our relationships could have occurred had such knowledge been available: the necessary beliefs concerning heredity are not sufficiently specific and we suspect that only *post hoc* hereditary hypotheses could be presented to describe many of our results.

In our study of the relationships between children's development and their environment, we have considered other sources of confounding, such as some hidden predictive value of the infant examination, and such as some systematic bias on the part of the mothers or on the part of our interviewers. For many of our relationships we can show that such sources of confounding are very implausible, indeed. It should be noted, however, that in those instances where the confounding hypothesis remains unchallenged, it cannot be claimed to be true, and that even for those possible instances one must consider the practical implications of the importance suggested by our data for the environmental differences.

It should be emphasized that our data provide numerous relationships for which no confounding hypothesis can be offered. For the most part, these relationships are suggestive of environmental

sources or circumstances which influence the personal-social aspects of the child's development.

In general, it seems that our total study has two broadly practical implications. First, it offers no encouragement to those who would depend upon an *infant* examination as a basis for anticipating the subsequent development of adoptive children. Second, it strongly suggests that many aspects of the development of children, particularly those we might call personal or social, emerge at least in part as a result of differences in the child's environment, particularly those differences which have to do with the values of the home and its child-rearing practices. From these two general results, one might suspect (if one desires to maximize the possibility of certain patterns of development in adoptive children) that much of the effort commonly devoted to an exact evaluation of infants considered for adoption could more profitably be devoted to a study of the applicants who desire to be adoptive parents. With respect to the welfare of the adoptive children and adoptive families, our data suggest that additional research would provide the basis for some training of adoptive applicants and of adoptive parents in certain aspects of child rearing. This, however, is for the future. For the present it is hoped that our exploration will encourage others in their efforts to devise and validate sound instructional procedures for those who desire to create homes where children are friendly, confident, and have good ability.

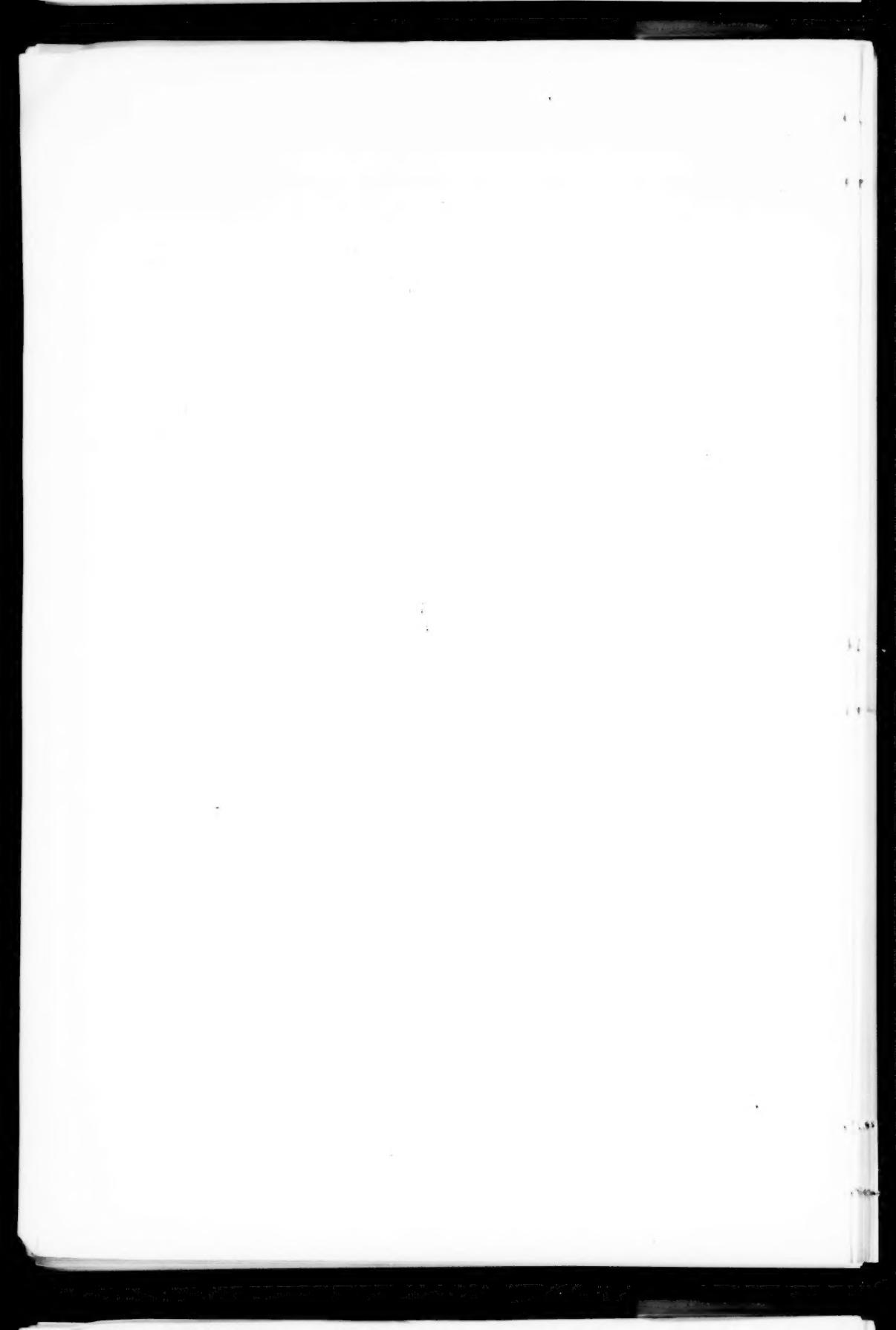
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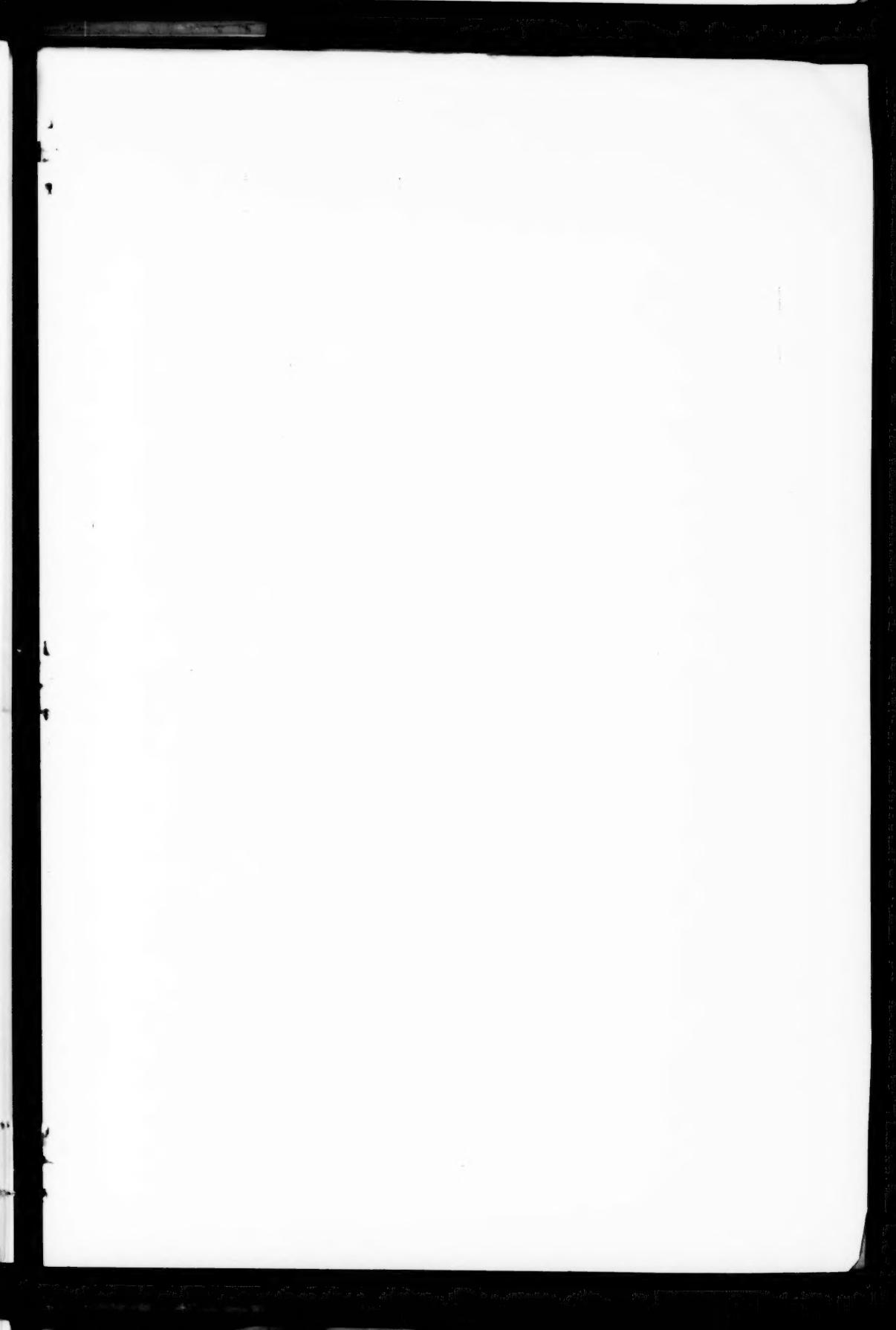
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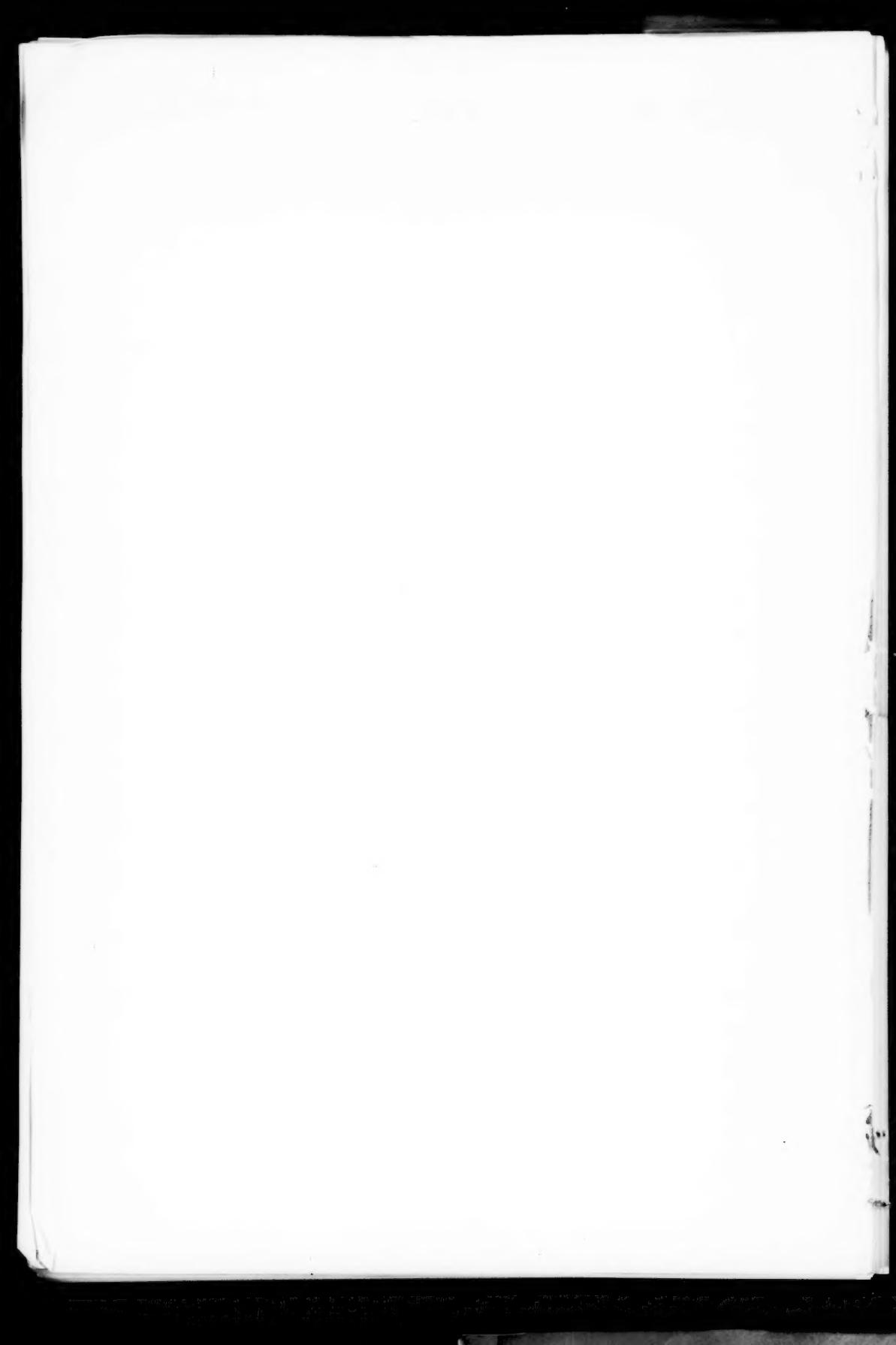
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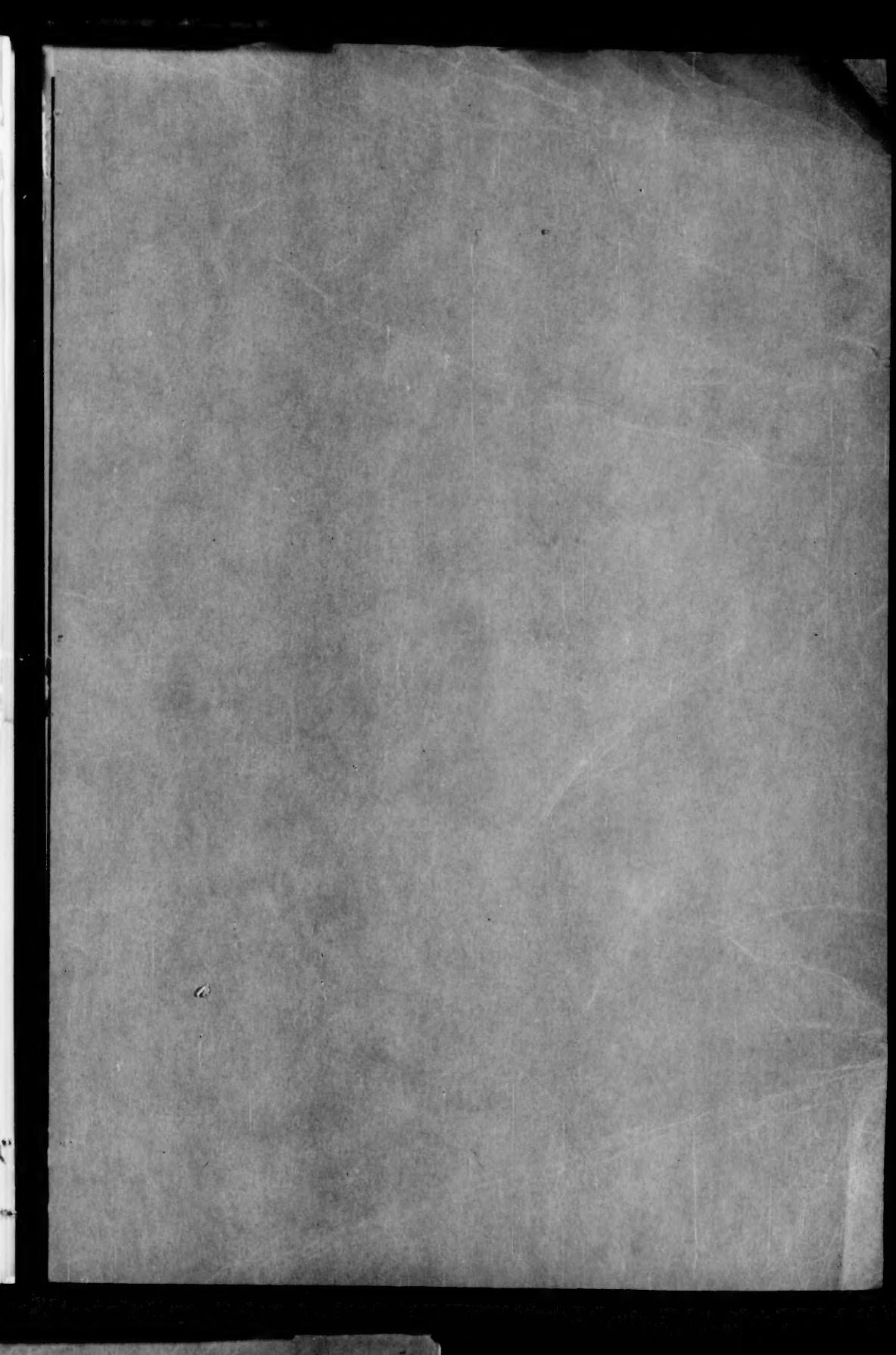
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(Accepted for early publication October 18, 1955)









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